National Institute of Environmental Health Sciences

Potential impact of global climate change on diarrhoeal disease in Mexico

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Abstract:

Background and Objective: Diarrhoeal is one of the principal causes of childhood morbidity and mortality in developing countries. It causes 2 million deaths in children every year and is the major cause of childhood hospitalization. Increase of diarrhoeal diseases are linked to ambient temperature as well as contamination of groundwater-fed water supplies after rainfall events, therefore it is important to estimate whether future projections of climate change will induce the increase of cases of this disease. The objective of this study is to project the future incidence of Diarrhoeal disease under a climate change scenario. Methods: Climate change projections were generated by ECHAM general circulation climate model under A2 scenario assuming emissions in 550 ppm CO2 by 2030. The excess of diarrhoeal diseases cases was estimated under this climate change scenario using (1) the average annual rate from 1998 to 2005; (2) literature base associating the increase of 5 percent of diarrhoeal cases with the increase of every degree C of temperature and 10 mm of precipitation; and (3) the projected number of diarrhoeal cases per 100000 inhabitants to 2030. Results: ECHAM A2 climate change scenario to 2030 is projected to increase the numbers of diarrhoeal cases by 5-12 percent. Most of the increase of cases is presented in the in coastal areas during the months of June, July, August and September. July and September are projected to be the months with higher increase of precipitation, but not with higher increase of temperature. Conclusion: Climate change is projected to increase the numbers of diarrhoeal cases and changes in precipitation are relevant to the results. Although some estimates of this disease have been calculated, these estimates need to be adjusted by other factors that influences over the disease and using more climate change scenarios.

Source: http://dx.doi.org/10.1097/01.ede.0000362749.71723.62
http://journals.lww.com/epidem/Fulltext/2009/11001/Potential_Impact_of_Global_Climate_Change_on.672.aspx

Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES)

Special Report on Emissions Scenarios (SRES) Scenario: SRES A2

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality, Precipitation, Temperature

Food/Water Quality: Pathogen

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

Ocean/Coastal

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Non-U.S. North America

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease, Morbidity/Mortality

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Other Diarrheal Disease

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Medium-Term (10-50 years)

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content